

## Optimizing a Hybrid Inventory System with Random Demand and Lead Time

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**Abstract :** Implementing either periodic or continuous inventory review model within most manufacturing-companies-supply chains as a management tool may incur higher costs. These high costs affect the system flexibility which in turn affects the level of service required to satisfy customers. However, these effects are not clearly understood because the parameters of both inventory review policies (protection demand interval, order quantity, etc.) are not designed to be fully utilized under different and uncertain conditions such as poor manufacturing, supplies and delivery performance. Coming up with a hybrid model which may combine in some sense the feature of both continuous and a periodic inventory review models should be useful. Therefore, there is a need to build and evaluate such hybrid model on the annual total cost, stock out probability and system's flexibility in order to search for the most cost effective inventory review model. This work also seeks to find the optimal sets of parameters of inventory management under stochastic condition so as to optimise each policy independently. The results reveal that a continuous inventory system always incurs lesser cost than a periodic (R, S) inventory system, but this difference tends to decrease as time goes by. Although the hybrid inventory is the only one that can yield lesser cost over time, it is not always desirable but also natural to use it in order to help the system to meet high performance specification.

**Keywords :** demand and lead time randomness, hybrid Inventory model, optimization, supply chain

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